

CLAIMS

What is claimed is:

1. A variable capacity rotary compressor, comprising:
 - a housing comprising two compression chambers, the two compression chambers having different capacities;
 - a rotating shaft rotatably provided in the two compression chambers;
 - two eccentric units respectively provided in the compression chambers so as to be fitted over the rotating shaft, the two eccentric units being operated so that one of the two eccentric units is positioned eccentrically from the rotating shaft to perform a compression operation while the other eccentric unit is positioned concentrically with the rotating shaft to perform an idle operation, according to a rotating direction of the rotating shaft;
 - roller pistons fitted over each of the two eccentric units;
 - vanes installed in each of the two compression chambers so as to reciprocate in a radial direction while being in contact with an outer surface of the roller piston; and
 - a path control unit to control a refrigerant suction path so that a refrigerant is provided to an inlet port of one of the two compression chambers which performs the compression operation.
2. The variable capacity rotary compressor according to claim 1, wherein the path control unit comprises:
 - a hollow body having a predetermined length, and being closed at both ends thereof;
 - a refrigerant inlet member;
 - an inlet formed at a central portion of the hollow body, and coupled to the refrigerant inlet member;
 - first and second outlets respectively formed on the hollow body at opposite sides of the inlet, and coupled to the inlet ports of the two compression chambers ;
 - a valve seat provided in the hollow body so as to form a decrease in the cross-sectional area of the hollow body, the valve seat having an opening on a sidewall thereof to allow an interior space thereof to communicate with the inlet and being opened at both ends thereof to communicate with the outlets; and
 - first and second valve units respectively provided at each end of the valve seat .

3. The variable capacity rotary compressor according to claim 2, wherein the valve seat has a length shorter than a distance between the two outlets, the valve seat being fitted into the hollow body so that the opening formed on the sidewall of the valve seat communicates with the inlet of the path control unit.

4. The variable capacity rotary compressor according to claim 3, further comprising a connecting member, wherein the first and second valve units are coupled to each other by the connecting member so as to be moved together.

5. The variable capacity rotary compressor according to claim 4, wherein the first and second valve units are axially reciprocating in the hollow body to open and close each end of the valve seat.

6. The variable capacity rotary compressor according to claim 5, wherein each of the first and second valve units comprises a thin valve plate able to come into contact with the valve seat .

7. The variable capacity rotary compressor according to claim 6, wherein each of the first and second valve units further comprises a support member to movably support the valve plate in the hollow body.

8. The variable capacity rotary compressor according to claim 7, wherein each support member has an outer diameter corresponding to an inner diameter of the hollow body so as to smoothly reciprocate in the body.

9. The variable capacity rotary compressor according to claim 8, wherein a plurality of holes are formed on the support member.

10. The variable capacity rotary compressor according to claim 4, wherein the first and second valve units move in a direction toward one of the two outlets having a lower pressure due to a difference in pressure between the two outlets, thus closing one of the both ends of the valve seat so that the inlet communicates with the outlet having the lower pressure.

11. The variable capacity rotary compressor according to claim 4, wherein the connecting member comprises at least two parts, the at least two parts of the connecting member being connected to each other by an elastic member to absorb shock.

12. The variable capacity rotary compressor according to claim 11, wherein the elastic member is made of a rubber having elasticity.

13. The variable capacity rotary compressor according to claim 1, wherein each of the two eccentric units comprises:

an eccentric cam fitted over the rotating shaft;

an eccentric bush rotatably fitted over the eccentric cam, with the roller piston fitted over the eccentric bush; and

a locking unit to fix the eccentric bush at a position where an outer surface of the eccentric bush is positioned eccentrically from the rotating shaft or at a position where the outer surface of the eccentric bush is positioned concentrically with the rotating shaft.

14. The variable capacity rotary compressor according to claim 8, wherein each of the locking units comprises:

a first locking part projected from the rotating shaft or the eccentric cam; and

a second locking part projected from a surface of the eccentric bush to contact the first locking part.

15. A variable capacity rotary compressor, comprising:

a housing comprising two compression chambers, the two compression chambers having different capacities;

a rotating shaft rotatably provided in the two compression chambers;

two eccentric units respectively provided in the compression chambers so as to be fitted over the rotating shaft, the two eccentric units being operated so that one of the two eccentric units is positioned eccentrically from the rotating shaft to perform a compression operation while the other eccentric unit is positioned concentrically with the rotating shaft to perform an idle operation, according to a rotating direction of the rotating shaft; and

vanes installed in each of the two compression chambers so as to reciprocate in a radial direction while being in contact with an outer surface of the eccentric units.

16. The variable capacity rotary compressor according to claim 15, wherein each of the two eccentric units comprises:

an eccentric cam fitted over the rotating shaft;

an eccentric bush rotatably fitted over the eccentric cam; and

a locking unit to fix the eccentric bush at a position where an outer surface of the eccentric bush is positioned eccentrically from the rotating shaft or at a position where the outer surface of the eccentric bush is positioned concentrically with the rotating shaft.

17. The variable capacity rotary compressor according to claim 16, wherein each of the locking units comprises:

a first locking part projected from the rotating shaft or the eccentric cam; and

a second locking part projected from a surface of the eccentric bush to contact the first locking part.

18. The variable capacity rotary compressor according to claim 17, wherein the locking units are arranged in opposite directions, so that when one of the eccentric units is positioned eccentrically from the rotating shaft by a rotation of the rotating shaft, the other eccentric unit is positioned concentrically with the rotating shaft.

19. The variable capacity rotary compressor according to claim 16, wherein the eccentric units further comprise a roller piston rotatably fitted over each of the two eccentric units.

20. The variable capacity rotary compressor according to claim 15, wherein the vanes are biased by an elastic member.

21. A variable capacity rotary compressor comprising:

a rotary shaft;

a first compression chamber having a first volume and size; and

a second compression chamber having a second volume and size,

wherein the first and second chambers selectively perform a compression operation according to the rotation direction of the rotary shaft.

22. The variable capacity rotary compressor according to claim 21, wherein an idle operation is performed in the second chamber while the compression operation is performed in the first chamber, and the idle operation is performed in the first chamber while the compression operation is performed in the second chamber.